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04-AMCP-0116

DEC 16 2003

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**EDMC**

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**Addressees:**

**TRANSMITTAL OF DOE/RL-2000-42, REVISION 3, RADIOACTIVE AIR EMISSIONS  
NOTICE OF CONSTRUCTION (NOC) FOR PLUTONIUM FINISHING PLANT  
STABILIZATION AND PACKAGING EQUIPMENT**

Enclosure 1 is a copy of the subject NOC application and off-permit modification request. This NOC application is being submitted to the Washington State Department of Health for approval pursuant to Washington Administrative Code 246-247-060.

Enclosure 2 is a Notification of Off-Permit Change to incorporate the NOC for potential radioactive air emissions from deactivation activities into the Hanford Site Air Operating Permit (AOP). This information is being provided to the State of Washington Department of Ecology consistent with the role as lead for the Hanford Site AOP.

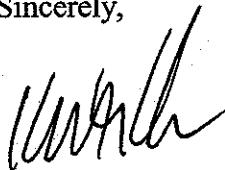
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04-AMCP-0116

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DEC 16 2003

If you have any questions, please contact me, or you may contact Stacy L. Charboneau, of the PFP Project Office, on (509) 373-3841.

Sincerely,



Keith A. Klein  
Manager

AMCP:WCW

Enclosures: (2)

cc w/encls`:

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Enclosure 1

**RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION (NOC), DOE/RL-2000-42,  
REVISION 3, RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION FOR  
PLUTONIUM FINISHING PLANT STABILIZATION AND PACKAGING EQUIPMENT**

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## GLOSSARY

1		
2		
3		
4	ANSI	American National Standards Institute
5	APQ	annual possession quantity
6	ASME	American Society of Mechanical Engineers
7		
8	BARCT	best available radionuclide control technology
9	BTC	bagless transfer container
10	BTS	bagless transfer system
11		
12	CFR	Code of Federal Regulations
13		
14	DOE	U.S. Department of Energy
15	DOE-RL	U.S. Department of Energy, Richland Operations Office
16		
17	EPA	U.S. Environmental Protection Agency
18	ERDA	U.S. Energy Research and Development Agency
19		
20	HEPA	high-efficiency particulate air
21	HPS	Health Physics Society
22	HVAC	heating, ventilation, and air conditioning
23		
24	LIGO	Laser Interferometer Gravitational Wave Observatory
25	LOI	loss on ignition
26		
27	MEI	maximally exposed individual
28	MPR	maximum public receptor
29		
30	NDA	nondestructive analysis
31	NOC	notice of construction
32		
33	PFP	Plutonium Finishing Plant
34	PTE	potential-to-emit
35		
36	scfm	standard cubic feet per minute
37	SFE	supercritical fluid extraction
38	SPE	stabilization and packaging equipment
39		
40	TEDE	total effective dose equivalent
41		
42	WAC	Washington Administrative Code
43	WDOH	Washington State Department of Health
44		

## METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
<b>Length</b>			<b>Length</b>		
inches	25.40	millimeters	millimeters	0.03937	inches
inches	2.54	centimeters	centimeters	0.393701	inches
feet	0.3048	meters	meters	3.28084	feet
yards	0.9144	meters	meters	1.0936	yards
miles (statute)	1.60934	kilometers	kilometers	0.62137	miles (statute)
<b>Area</b>			<b>Area</b>		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.09290304	square meters	square meters	10.7639	square feet
square yards	0.8361274	square meters	square meters	1.19599	square yards
square miles	2.59	square kilometers	square kilometers	0.386102	square miles
acres	0.404687	hectares	hectares	2.47104	acres
<b>Mass (weight)</b>			<b>Mass (weight)</b>		
ounces (avoir)	28.34952	grams	grams	0.035274	ounces (avoir)
pounds	0.45359237	kilograms	kilograms	2.204623	pounds (avoir)
tons (short)	0.9071847	tons (metric)	tons (metric)	1.1023	tons (short)
<b>Volume</b>			<b>Volume</b>		
ounces (U.S., liquid)	29.57353	milliliters	milliliters	0.033814	ounces (U.S., liquid)
quarts (U.S., liquid)	0.9463529	liters	liters	1.0567	quarts (U.S., liquid)
gallons (U.S., liquid)	3.7854	liters	liters	0.26417	gallons (U.S., liquid)
cubic feet	0.02831685	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.7645549	cubic meters	cubic meters	1.308	cubic yards
<b>Temperature</b>			<b>Temperature</b>		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
<b>Energy</b>			<b>Energy</b>		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.94782	British thermal unit per second	British thermal unit per second	1.055	kilowatt
<b>Force/Pressure</b>			<b>Force/Pressure</b>		
pounds (force) per square inch	6.894757	kilopascals	kilopascals	0.14504	pounds per square inch

06/2001

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Third Ed., 1993, Professional Publications, Inc., Belmont, California.

**RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION FOR PLUTONIUM  
FINISHING PLANT  
STABILIZATION AND PACKAGING EQUIPMENT**

**1.0 INTRODUCTION**

Revision 0 of this notice of construction (NOC) was submitted June 5, 2000, to the U.S. Environmental Protection Agency and Washington State Department of Health<sup>1</sup> (WDOH). WDOH approved the NOC with conditions and limitations on July 20, 2000<sup>2</sup>. Under separate correspondence, the EPA also approved the NOC on July 20, 2000<sup>3</sup>. On September 27, 2000, Revision 1 of the subject NOC was submitted to the EPA and WDOH for approval<sup>4</sup>. Revision 1 was not approved. Information regarding technology standards associated with Project W-460 was requested. Revision 2, approved August 21, 2001, superseded Revision 1 and incorporated requested details associated with technology standards as those standards applied to Project W-460 radioactive air emissions. Revision 2A, addressing use of thermogravimetric analysis as an analytical method for moisture determination, was approved October 2, 2001. Revision 2B, addressing stabilization of plutonium metal in the 2736-ZB Building, was approved October 1, 2002. A revision (Revision 2C), clarifying that supercritical fluid extraction would no longer be considered for moisture determination was approved December 9, 2002. This revision (Revision 3) supersedes Revision 2C, and incorporates changes identified in Revisions 2A, 2B, and 2C, updates projected annual possession quantity, and depicts the operational phase of Project W-460 ("Plutonium Stabilization and Packaging"), hereafter referred to as Stabilization and Packaging Equipment (SPE).

The following description and any attachments and references are provided to WDOH, Division of Radiation Protection, Air Emissions & Defense Waste Section as a NOC in accordance with Washington Administrative Code (WAC) 246-247, Radiation Protection – Air Emissions. The WAC 246-247-060, "Applications, registration, and licensing", states "This section describes the information requirements for approval to construct, modify, and operate an emission unit. Any NOC requires the submittal of information listed in Appendix A". Additionally, the following description, attachments, and references are provided to the EPA for information.

This NOC covers the activities associated with operations in the 2736-Z Building and the 2736-ZB Building involving stabilization and/or repackaging of plutonium oxides, alloys, metals, and holdup material removed from PFP Complex equipment and systems during deactivation.

For the activities covered under this NOC, the unabated and abated TEDE to the hypothetical MEI is 4.0 E+03 and 1.2 E-03 millirem per year, respectively.

<sup>1</sup> DOE-RL 00-OSS-366 DOE-RL to J.M. Leitch, EPA, and A.W. Conklin, WDOH, from S.H. Wisness, dated June 5, 2000.

<sup>2</sup> WDOH AIR 00-709, WDOH letter to S.H. Wisness, DOE-RL, from A.W. Conklin, dated July 20, 2000.

<sup>3</sup> EPA OAQ-107, EPA letter to S.H. Wisness, DOE-RL, from B. McAllister, dated July 20, 2000.

<sup>4</sup> DOE-RL 00-RCA-002, DOE-RL letter to J.M. Leitch, EPA, and A.W. Conklin, WDOH, from S.H. Wisness, dated September 27, 2000.

## 2.0 FACILITY LOCATION (REQUIREMENT 1)

U. S. Department of Energy, Richland Operations Office  
825 Jadwin Avenue  
P.O. Box 550  
Richland, Washington 99352-3562

The coordinates for the 296-Z-7 stack are as follows:

2736-ZB Building, 200 West Area  
Latitude: 46° 33' 00"  
Longitude: 119° 37' 60"

## 3.0 RESPONSIBLE MANAGER (REQUIREMENT 2)

The responsible manager for the activities described under this NOC is as follows:

Mr. Matthew S. McCormick, Assistant Manager for Central Plateau  
U.S. Department of Energy, Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352-3562  
(509) 372-1786

## 4.0 TYPE OF PROPOSED ACTION (REQUIREMENT 3)

The proposed action results in the continued operation of a major emission unit (refer to Table 3 for potential releases) and two minor emission units. The proposed action is a significant modification to the existing major emission unit (296-Z-7 stack).

## 5.0 STATE ENVIRONMENTAL POLICY ACT (REQUIREMENT 4)

The proposed action categorically is exempt from the requirements of the *State Environmental Policy Act of 1971* under WAC 197-11-845.

## 6.0 PROCESS DESCRIPTION (REQUIREMENT 5)

Figure 1 provides a SPE process flow diagram. A brief description of the SPE and processes conducted in the 2736-Z Complex are as follows.

- #1-Stabilization Module. The Stabilization Module consists of the material preparation area, furnace area, and the product fill area. In the material preparation area, canned items containing plutonium-bearing materials are received, measured for accountability, and placed into a furnace tray (or boat) for insertion into a furnace in the furnace area. The module also provides a waste pathway

1 to dispose of the waste cans and plastic. In the furnaces, the material in the boats is thermally  
2 stabilized to meet U.S. Department of Energy Standard 3013 (DOE-STD-3013, *Stabilization,*  
3 *Packaging, and Storage of Plutonium-Bearing Materials*). The material is cooled, placed in a  
4 convenience can, sampled to verify dryness, and inserted into the Bagless Transfer System (BTS)  
5 Module.

- 6
- 7 • #2-BTS Module. In the BTS Module, the filled convenience cans are received from the Stabilization  
8 Module and placed into an inner can. The inner can head space is backfilled with helium. A plug is  
9 welded to the inner wall of the container, and the middle of the weld cut (maintaining glovebox  
10 confinement at all times).
- 11
- 12 • #3-Inner Can Leak Test Module. The Inner Can Leak Test Module receives an inner welded  
13 container [bagless transfer container (BTC)]. Operations in this module verify the BTC meets or  
14 exceeds the leak tightness requirements of DOE Standard 3013.
- 15
- 16 • #4-Outer Can Weld Module. The Outer Can Weld Module receives a leak-checked BTC. The BTC  
17 is placed in an outer container. The outer can head space is backfilled with helium, and an outer  
18 container lid is welded onto the container in accordance with the requirements of DOE Standard  
19 3013.
- 20
- 21 • #5-Outer Can Leak Test Module. The Outer Can Leak Test Module receives an outer welded  
22 container (3013 package) and operations in this module verify the package meets or exceeds the leak  
23 tightness requirements of 3013.
- 24
- 25 • #6-NDA Laboratory Modification Module. The Nondestructive Analysis (NDA) Laboratory receives  
26 the 3013 package and analyzes the 3013 package for isotopic distribution, heat load, and container  
27 baseline. The 3013 package is subjected to radiography to monitor BTC pressurization  
28
- 29 • #7-Vault Modification Module. The secure vault storage locations in the 2736-Z Building will  
30 continue to be modified to accommodate the 3013 packages. These packages will be sealed, offering  
31 no additional potential-to-emit (PTE).
- 32

33 Plutonium and uranium processed in the stabilization and repackaging process under SPE will be in the  
34 form of oxides (including hold-up material) and metal (Figure 1). Americium, plutonium, and uranium  
35 oxides will be stabilized by heating the material in an oven to meet DOE Standard 3013. Plutonium  
36 oxides with metal chunks might be encountered. The material could be sieved and the oxides thermally  
37 stabilized. The metal chunks could be brushed and packaged, or thermally stabilized. Hold-up  
38 plutonium-bearing material removed from equipment and systems within the PFP Complex might be in  
39 the form of powder, sweeps (such as residue), and/or dried sludge (with small quantities of volatile  
40 organics). This material could be mechanically handled (e.g., sieved, brushed) before being thermally  
41 stabilized.

42

43 The gloveboxes have two exhaust systems, normal and emergency. The normal exhaust exit points have  
44 a roughing filter and fire screen inside the glovebox. Immediately outside each normal exhaust  
45 connection is a high-efficiency particulate air (HEPA)-type process filter. The nominal operating  
46 temperature inside the glovebox is approximately 40°C. The emergency exhaust exits do not have any  
47 filters or screens inside the glovebox or immediately outside the glovebox. The normal and emergency  
48 exhaust lines are combined and routed to the process exhaust HEPA filter system. After exiting the dual  
49 stage of HEPA filters, the offgas exits through the 296-Z-7 stack.

50

In-line monitoring equipment is provided for determining the moisture/volatile content of the material processed. The material is considered thermally stabilized when there is less than 0.5 percent loss on ignition (LOI). Gaseous effluents from moisture determination operations are discharged directly into the glovebox, passed through glovebox HEPA-type filters, and then pass through two stages of HEPA filtration before discharge to the environment via the 297-Z-7 stack.

All stabilized plutonium-bearing materials will be containerized in an inner-welded and outer-welded container (i.e., the aforementioned 3013 package) and placed in secure vault storage (2736-Z Building) pending final disposition. A vault HVAC supply isolation damper is in place on the supply air to prevent unfiltered release of plutonium from the building via backflow out the HVAC supply system (Figure 2).

## 7.0 ANNUAL POSSESSION QUANTITY AND PHYSICAL FORM (REQUIREMENTS 8, 10, AND 11)

The annual possession quantity for the 296-Z-5 emission unit is assumed to be an annual throughput of 1.6 metric tonnes plutonium (100 percent plutonium-239,  $1.0 \times 10^5$  curies), 1.1 metric tonnes uranium (100 percent uranium-233,  $1.1 \times 10^4$  curies)<sup>5</sup>, and 0.05 metric tonne americium (100 percent americium-241,  $1.7 \times 10^5$  curies). Additionally, neptunium (as neptunium-237) and miscellaneous decay products are expected to be present. The annual possession quantity for the 296-Z-6 emission unit is assumed to be  $2.3 \times 10^5$  curies plutonium-239,  $2.5 \times 10^4$  curies uranium-233, and  $1.3 \times 10^5$  curies americium-241. These materials are expected to be present predominantly as tightly closed or sealed sources, and as such would not contribute substantially to potential releases from the 296-Z-5 or 296-Z-6 emission units.

The releasable quantity for SPE activities affecting the existing 2736-ZB Building ventilation system (exhausting through the existing 296-Z-5 stack exhaust) was estimated. Estimates are based on the nature of operations associated with activities in the 2736-ZB Building (i.e., plutonium handling). Although no alpha or beta radiological emissions were detected in Calendar Year 2002, the following provides development of a hypothetical maximum plutonium (alpha) annual possession quantity.

- Assume smearable alpha contamination is present as Pu-239 on the exterior of an inner-welded container that is transported to 2736-ZB Building Room 641 for outer welding (note that Room 641 exhausts through the existing 296-Z-5 stack).
- The smearable alpha is considered some multiplier of a hot speck. A hot speck alpha is defined as a very small amount of contamination reading >50 counts per minute. For conservatism, the multiplier is assumed to be 100. Therefore, the maximum alpha activity is considered to be 5,000 counts per minute per inner-welded container.
- It is assumed that 100 inner containers per year have smearable contamination when transferred to Room 641. Therefore the annual possession quantity alpha is based on 500,000 counts per minute.
- Activity of Pu-239 is  $1.4 \times 10^{11}$  disintegrations per minute per gram. Inverting and multiplying yields  $3.6 \times 10^{-6}$  grams of Pu-239. Further, given 0.062 curie per gram of Pu-239, the annual possession

<sup>5</sup> The actual isotopes of uranium expected to be encountered during stabilization and packaging activities are U-234, U-235, U-236, U-237, and U-238. However, for conservatism, the annual possession quantity (APQ) for uranium was based on U-233. That is, the specific activity of U-233 (0.009% curie per gram) is greater than the specific activity of either U-235 or U-238 (0.0000022 curie per gram and 0.00000034 curie per gram, respectively). Thus, the most conservative value for curie release was provided in NOC calculations.

1 quantity alpha equals  $2.2 \times 10^{-7}$  curies alpha.

- 2
- 3 • Finally, applying an additional conservative factor of 1000 (as with beta calculations), the maximum  
4 postulated annual possession quantity alpha would be  $2.2 \times 10^{-4}$  curies from smearable contamination  
5 on inner-welded containers.
- 6

7 Further, normal operations in the 2736-ZB Building involve container handling in locations venting  
8 through the 296-Z-5 stack. Such operations include NDA analyses and overpacking. For conservatism, it  
9 is assumed that 5 curies of alpha (as Pu-239) are associated with these activities. Thus, a total of 5 curies  
10 of alpha are considered available for release through the 296-Z-5 stack (summing the smearable and  
11 overpacking alpha inventories).

12

13 Additionally, historical monitoring of the 296-Z-5 stack has indicated beta releases. For example, the  
14 total measured release from the 296-Z-5 stack exhaust for calendar year 1998, as documented in  
15 DOE/RL-99-41 (*Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 1998*), was as  
16 follows: total alpha was not detected and total beta was  $1.2 \times 10^{-7}$  curies. Therefore, for conservatism,  
17 1000 times the 1998 emissions from the 296-Z-5 stack (i.e.,  $1.2 \times 10^{-4}$  curies) is the maximum annual beta  
18 (assuming Sr-90) release anticipated during operations associated with activities emitting through the  
19 296-Z-5 stack.

20

21 Similar conservative assumptions regarding releasable material from the 2736-Z Building (the  
22 296-Z-6 stack) result in 5 curies of alpha (for calculations assuming Pu-239) and  $1.2 \times 10^{-4}$  curies of beta  
23 (for calculations assuming Sr-90).

24

25 The existing ventilation and monitoring systems for the 2736-Z and 2736-ZB Buildings will remain  
26 operational during material handling activities. Alarms will be activated in the event of off-normal  
27 emissions. Work would cease until the source/extent of the contamination could be assessed. If  
28 necessary, work control procedures will be modified and implemented to ensure personnel and public  
29 safety before continuation of activities.

30

31 Tables 4 and 5 show potential release rates and associated doses associated with calculated releases from  
32 the 296-Z-5 and 296-Z-6 stacks.

33

34 The annual possession quantity for operations (i.e., stabilization and packaging activities) resulting in  
35 emissions through the 296-Z-7 stack is based on a conservative estimate for the maximum amount of  
36 material that could be stabilized and repackaged in a year (refer to Table 3).

37

38 Activities associated with SPE assume an annual throughput of 1.6 metric tonnes plutonium (100 percent  
39 plutonium-239), 1.1 metric tonnes uranium (100 percent uranium-233)<sup>5</sup>, and 0.05 metric tonne americium  
40 (100 percent americium-241). Additionally, neptunium (as neptunium-237) and miscellaneous decay  
41 products are expected to be present. Potential emissions are shown in Table 3, and potential calculated  
42 doses are shown in Table 6. Total SPE projected doses are shown in Table 7.

43

44 The physical form of all radionuclides encountered during stabilization and packaging activities would be  
45 expected to be dry particulates. The physical form of all radionuclides emitted is expected to be  
46 particulate.

47

48 Potential radionuclides expected to be encountered during stabilization, and packaging activities include:  
49 uranium-234, uranium-235, uranium-236, uranium-237, uranium-238, plutonium-238, plutonium-239,  
50 plutonium-240, plutonium-241, plutonium-242, americium-241, americium-243, and neptunium-237.  
51 Small amounts of beta-emitting isotopes and other decay products may be present due to the inherent

1 nature of radioisotopes; these beta emitters and other decay products would not contribute significantly to  
2 the calculated potential-to-emit.

## 3 4 5 **8.0 ABATEMENT TECHNOLOGY AND CONCEPTUAL DRAWING(S)** 6 **(REQUIREMENTS 6 AND 7)**

7 Figure 2 shows the overall ventilation schematic emission sources, and identifies safety systems,  
8 structures, and components. This figure depicts the general flow patterns for the various offgas systems.  
9 Emissions resulting from work performed within the 2736-ZB Building will be exhausted out the existing  
10 296-Z-5 stack, which contains two stages of HEPA filtration with a minimum efficiency of 99.95 percent  
11 for particles with a median diameter of 0.7 micron. The average flow rate for the 296-Z-5 stack in 2002  
12 was reported to be 2.0 cubic meters per second (DOE/RL-2003-19). The average flow rate for the  
13 296-Z-6 stack in 2002 was reported to be 3.1 cubic meters per second (DOE/RL-2003-19).

14  
15 Stabilization and packaging activities are conducted predominantly in Rooms 642 and 641 of the  
16 2736-ZB Building. The resulting emissions are exhausted through the 296-Z-7 stack that contains two  
17 stages of HEPA filtration with a minimum efficiency of 99.95 percent for particles with a median  
18 diameter of 0.7 micron. The average flow rate for the 296-Z-7 stack in 2002 was reported to be  
19 0.69 cubic meters per second (DOE/RL-2003-19). Figure 3 shows a schematic for the SPE offgas system  
20 exhausting through the 296-Z-7 stack.

## 21 22 23 **9.0 MONITORING SYSTEM (REQUIREMENT 9)**

24 The 296-Z-5 stack exhausts filtered air from the 2736-ZB Building. Emission sampling consists of a  
25 record sampler for particulate radionuclides. This stack is registered with WDOH, with emissions  
26 estimated or verified using methods approved by the EPA and WDOH. Most recent data are reported in  
27 DOE/RL-2003-19.

28  
29 The 296-Z-6 stack exhausts filtered air from the 2736-Z Building. Emission sampling consists of a record  
30 sampler for particulate radionuclides. This stack is registered with WDOH, with emissions estimated or  
31 verified using methods approved by the EPA and WDOH. Most recent data are reported in  
32 DOE/RL-2003-19.

33  
34 The 296-Z-7 stack exhausts filtered air from stabilization and packaging activities conducted in the  
35 2736-ZB Building. The stack/emission sampling consists of a continuous air monitor record sampler for  
36 particulate radionuclides and flow monitor. This stack is registered with WDOH, with emissions  
37 estimated or verified using methods approved by the EPA and WDOH. Most recent data are reported in  
38 DOE/RL-2003-19.

## 39 40 41 42 **10.0 RELEASE RATES (REQUIREMENTS 12 AND 13)**

43 The release rates associated with the 296-Z-5 and 296-Z-6 stacks are based on operational history. The  
44 annual possession quantity for stabilization and packaging activities (with potential emissions through the  
45 296-Z-7 stack) was multiplied by the conservative release factor of 1.0 E-03 for particulates and solutions  
46 (40 CFR 61, Appendix D). Although the furnace(s) could operate at temperatures near 1,000°C, the

boiling point temperature of plutonium, americium, and uranium oxides and metals is well above 1,000°C. At high temperatures, the oxides will undergo transformation to a pure metal state. For americium, plutonium, and uranium oxides, the transformation begins to occur at a temperature of approximately 1,150°C, 1,500°C, and 2,800°C, respectively. The boiling point of metallic americium, plutonium, and uranium occurs at 2,607°C, 3,232°C, and 3,818°C, respectively. The release rate conservatively assumes that all material is stabilized and repackaged. Pure metals and alloys only will be repackaged. The 296-Z-7 stack will be operated in a continuous mode.

## 11.0 OFFSITE IMPACT (REQUIREMENTS 14 AND 15)

The maximally exposed individual is a maximum public receptor (MPR) assumed to be a non-DOE worker who works within the Hanford Site boundary and who eats food grown regionally. The MPR was assumed to be located at the Laser Interferometer Gravitational Wave Observatory (LIGO). LIGO is approximately 22,000 meters (14 miles) southeast from PFP.

## 12.0 COST FACTORS AND FACILITY LIFETIME (REQUIREMENTS 16 AND 17)

Requirement 16 is not applicable because a best available radionuclide control technology (BARCT) demonstration is provided (Attachment A).

The maximum design life of the 2736-ZB stabilization and packaging activities is approximately 18 years (completion on or before October 1, 2021).

## 13.0 TECHNOLOGY STANDARDS (REQUIREMENT 18)

The following sections address technology standards for the minor stacks (296-Z-5 and 296-Z-6) and the major stack (296-Z-7).

### 13.1 296-Z-5 AND 296-Z-6 STACKS

*Indicate which of the following control technology standards have been considered and will be complied with in the design and operation of the emission unit described in this application:*

*ASME/ANSI AG-1, ASME/ANSI N509, ASME/ANSI N510, ANSI/ASME NQA-1, 40 CFR 60, Appendix A Methods 1, 1A, 2, 2A, 2C, 2D, 4, 5, and 17, and ANSI N13.1*

*For each standard not so indicated, give reasons to support adequacy of the design and operation of the emission unit as proposed.*

The 296-Z-5 and 296-Z-6 stacks are registered emissions units with WDOH.

The abatement control systems for the 296-Z-5 and 296-Z-6 stacks were installed in the early 1980's and late 1970's (respectively) before this requirement for control technology standards was specified in WAC 246-247 (April 1994). Although the listed technology standards, if available at time of construction, might have been followed as guidance, there was no regulatory requirement for compliance

with the listed standards. Operational history, routine maintenance, testing, and inspections (ANSI N509 and N510) demonstrate adequacy of the design and operation of the existing abatement control technology as proposed. A summary is provided in Table 1 of the status of conformance by the ventilation and monitoring systems. Cited documents will be provided to WDOH on request.

- ASME/ANSI AG-1:

The 296-Z-5 and 296-Z-6 stacks and ventilation systems were built before compliance with the code was required. Regarding the section in AG-1 on HEPA filters, the HEPA filters in the ventilation systems for the 296-Z-5 and 296-Z-6 stacks meet all criteria dealing with filter qualification testing. Other sections in AG-1 either are not applicable (e.g., adsorbers or moisture separators) or are addressed under ANSI N509.

- ASME/ANSI N509:

The HEPA filters conform to ASME N509, Section 5.1. Documentation to show full compliance with the remaining sections of ANSI N509 cannot be provided. Instead, the following information is provided to support adequacy of design.

ANSI N510 was established in 1976. ANSI N509 was established in 1977. Before 1976, testing and maintenance was based on DOE Orders, which included guidance provided in ERDA 76-21, *The Nuclear Air Cleaning Handbook*.

Design adequacy of the fans is demonstrated by operational history and/or passing routine functional tests. Regular visual inspections of the fans and motors in accordance with current maintenance procedures and schedules ensure proper and consistent function. The operating fans and motors are inspected for operational variables such as abnormal noise, excessive vibration, and fan bearing temperatures, and are lubricated as needed.

Adequacy of the HEPA filters and housings has been demonstrated by operational history and successful testing in accordance with guidance provided in ASME/ANSI N510. The existing systems have been successfully tested annually in their current configurations since construction.

- ASME/ANSI N510:

As allowed in ASME/ANSI N510, certain sections of N510 can be used as technical guidance for non-N509 systems. To demonstrate the adequacy of the system design and operation, final stages of HEPA filters are aerosol tested individually in-place annually (at a minimum control efficiency of 99.95 percent) to meet the intent of ANSI N510. This annual testing includes a visual inspection of the housing as described in ANSI N510.

- ANSI/ASME NQA-1:

NQA-1 sections addressing abatement technology components design were not applicable during systems construction and so are not addressed. Quality assurance for sampling of emissions and subsequent analysis is addressed in HNF-0528-3, *NESHAP Quality Assurance Project Plan for Radioactive Airborne Emissions* (all of Sections 2.0, 3.0 and 5.0), which was written in accordance with applicable NQA-1 requirements.

- 40 CFR 60, Appendix A

Stack flow is tested using Methods 1 and 2. Methods 1A, 2A, 2C, and 2D are not applicable to the stack

1 dimensions/design. Relative humidity (as allowed in Method 2) is measured with a calibrated hygrometer  
2 or with wet and dry bulb readings. Methods 4, 5, and 17, which provide a method for measuring relative  
3 humidity for combustion sources, are not applicable to radioactive airborne effluent stacks.

4  
5 • ANSI N13.1:

6  
7 The sampling system complies with ANSI N13.1 (1969) criteria. For each stack, emission sampling  
8 consists of a record sampler for particulate radionuclides.

9  
10 – The 296-Z-5 stack record sampler is operational. Stack discharge air is sampled continuously and  
11 monitored. Currently the sample systems are operated to provide periodic confirmatory  
12 measurements only.

13  
14 – The 296-Z-6 stack record sampler is operational. Filtered exhaust air is near-isokinetically sampled  
15 and monitored continuously. Currently, the sample systems are operated to provide only periodic  
16 confirmatory measurements.

17  
18 Adequacy of the sampling systems is demonstrated by inspection, calibration, and maintenance activities  
19 as scheduled in current facility procedures.

20  
21  
22 **13.2 296-Z-7 STACK**

23 The 296-Z-7 stack is a registered emissions unit with WDOH. A summary is provided in Table 2 of the  
24 status of conformance by the ventilation and monitoring systems (cited documents will be provided upon  
25 request). The stack meets control technology standards listed in WAC 246-247-110(18) as follows.

26  
27 • ASME AG-1, Code on Nuclear Air and Gas Treatment.

28  
29 The exhaust fans meet the requirements of AG-1, Section BA. Procurement specification W460-P10  
30 titled, "Procurement Specification Centrifugal Exhaust Fan for the SPE Exhaust System for the Plutonium  
31 Storage and Handling Facility" states the following, "The fans shall meet ASME N509 sections 5.7 and  
32 5.8, and section BA of ASME AG-1. (If conflicts with other standards listed occur, ASME AG-1 shall  
33 take precedence)."

34  
35 Construction Specification W460-C2, Section 15500 states, "The nuclear grade HEPA filters shall meet  
36 the requirements of ASME AG-1-1997 Code on Nuclear Air and Gas Treatment, section FC-1000-  
37 through section FC-9200 and specification HNF-S-0552 Procurement specification of Nuclear Grade  
38 High Efficiency Particulate Air (HEPA) Filters".

39  
40 Other sections in AG-1 either are not applicable (e.g., adsorbers or moisture separators) or are addressed  
41 under ANSI N509.

42  
43 • ASME N509, Nuclear Power Plant Air-Cleaning units and Components.

44  
45 The HEPA filter housings located at the gloveboxes and Room 642 exhaust are Flanders® G1 type filter  
46 housings. The final HEPA exhaust filtration train located in HEPA filter room 641B are Flanders filter  
47 housings type BG bag out containment series. Both types of the HEPA filter housings meet the design  
48 and construction requirements of ASME N509.

® Flanders/CSC, Bath, North Carolina.

1  
2 The exhaust piping and fittings from the gloveboxes to the inlet of the final HEPA filtration exhaust trains  
3 located in HEPA filter room 641B are schedule 10S stainless steel. The exhaust piping and fittings from  
4 the discharge side (outlet) of the filter train to inlet of exhaust fans EF-1 and EF-2, located out of doors,  
5 are schedule 20 carbon steel. Both the inlet and outlet pipe and fittings meet the design and construction  
6 requirements of ASME N509.

7  
8 All valves that are used to isolate components, (e.g., HEPA filters, control valves, etc.) are butterfly  
9 valves and meet the requirements of ASME N509, paragraph 5.9, and the requirements for class A  
10 construction. The valves were tested in accordance with paragraph 5.9.7.3, which is a bubble test.

11  
12 • ASME N510, Testing of Nuclear Air Treatment Systems

13  
14 Before leaving the factory, all HEPA filter housings are tested to ASME N510 requirements to  
15 demonstrate system design adequacy. After the HEPA filter systems have been installed, the systems are  
16 tested to meet the housing leak test requirement of ASME N510, Section 6.

17  
18 In-place aerosol testing of each filter bank also is performed per Section 10 to ensure the penetration  
19 requirements of 99.95% has been accomplished.

20  
21 Test and inspection frequencies will be performed as minimum per ASME N510, Table 1, to maintain  
22 system reliability.

23  
24 After installation, the ductwork/piping was leak tested to ASME N510, Section 6 to ensure the system  
25 meets the leakage requirements of the test plans.

26  
27 All isolation valves were factory leak tested to class I requirements of the bubble test method as outlined  
28 in ASME N509, paragraph 5.9.7.3.

29  
30 The fan procurement specification (W460-P-10) states the fan housing will be made airtight. Fan shaft  
31 leakage will be limited to 0.01% of the normal air flow per inch of fan operating pressure, or 0.5 scfm,  
32 whichever is greater. The fan housing was pressurized to 1.25 times the fan operating pressure.

33  
34 • ANSI/ASME NQA-1 Quality Assurance Program Requirements for Nuclear Facilities

35  
36 The exhaust system from the gloveboxes to the exhaust stack includes structures and components that  
37 have different safety classifications assigned to varying segments of the system. The system has been  
38 broken into the following three main areas.

- 39  
40 – Ductwork, HEPA filter housings and valves from the gloveboxes to the final HEPA filter housing  
41 were designated as Safety Significant.  
42  
43 – The final stage HEPA filter housing located before the exit of 2736-ZB and the discharge side  
44 ductwork up to, and including the penetration of the exterior building wall, were designated as Safety  
45 Class.  
46  
47 – The ductwork exterior to the building, exhaust fans, and stack were classified as General Services.

48  
49 As a means for complying with the requirements set forth in 10 CFR 830.120, *Quality Assurance*,  
50 applicable criteria from ANSI/ASME NQA-1, *Nuclear Quality Assurance*, have been used. Quality  
51 programmatic requirements for the Safety Class and Safety Significant structures and components have

1 been imposed based on ANSI/ASME NQA-1 criterion, as determined by the extent of the efforts being  
2 applied (e.g., Basic Requirements 1-18; less if there are no design efforts required).

3  
4 Specifications were prepared for major components for the Safety Class (such as the HEPA filter  
5 housing) and safety significant portions. These components are procured from suppliers found on the  
6 Fluor Hanford Evaluated Supplier List. Smaller components (such as ductwork piping, fittings, and  
7 valves) are procured from vendors on the Evaluated Supplier List or by a Commercial Grade Items  
8 method.

9  
10 All other structures and components that were designated as General Services were procured on material  
11 specific procurements as commercial products, not necessarily from vendors on the Evaluated Supplier  
12 List. Some of the major components (such as the exhaust fans) were procured based on technical and  
13 quality requirements identified in procurement specifications.

14  
15 • ANSI/HPS N13.1-1999 "Sampling and Monitoring Releases of Airborne Radioactive Substances  
16 from the Stacks and Ducts of Nuclear Facilities"

17  
18 The stack sampling system for the 296-Z-7 exhaust stack is designed in accordance with ANSI/HPS  
19 N13.1-1999. The system uses two identical and independent shrouded probes mounted in a parallel  
20 configuration within the stack at an elevation of approximately 25 feet. The sample streams are routed  
21 out of the stack and down to an instrument cabinet located at the base of the stack. After sampling and  
22 monitoring, air is returned via vacuum pumps to the stack at a location above the sample elevation.

23  
24 The sample flow for the alpha monitor is controlled to a fixed flow rate. The flow to the record filter is  
25 controlled to a flow rate that is proportional to the stack flow. Stack mass flow (compensated for  
26 temperature and pressure) is monitored using an annubar flow element located in the stack just above the  
27 sampling location. The flow element contains an integral temperature sensor. Signals from the  
28 flow/temperature element are routed to a flow indicating transmitter located in the instrument cabinet.  
29 The transmitter displays mass flow and provides a proportional signal for sample flow control.

30  
31 The stack flow measurement was validated by comparison to manual flow measurements in accordance  
32 with section 6.2 of ANSI/HPS N13.1-1999. Methods used will be 40 CFR 60, Appendix A, Method 1  
33 and 2, modified.

34  
35 The stack and sampling system was qualified to the criteria in Table 4 of ANSI/HPS N13.1-1999.

36  
37 Acceptance criteria given in Section 6.4.1 of ANSI/HPS N13.1-1999 have been addressed (Fluor 2003).

38  
39 • 40 CFR 60, Appendix A, Standards of Performance for New Stationary Sources

40  
41 The stack flow monitoring system was validated using Appendix A, Methods 1 and 2 as modified per  
42 ANSI/HPS N13.1-1999, Section 6.2. The flow monitoring system is tested annually.

Table 1. Status of Conformance to Technology Standards for Minor Stacks 296-Z-5 and 296-Z-6.

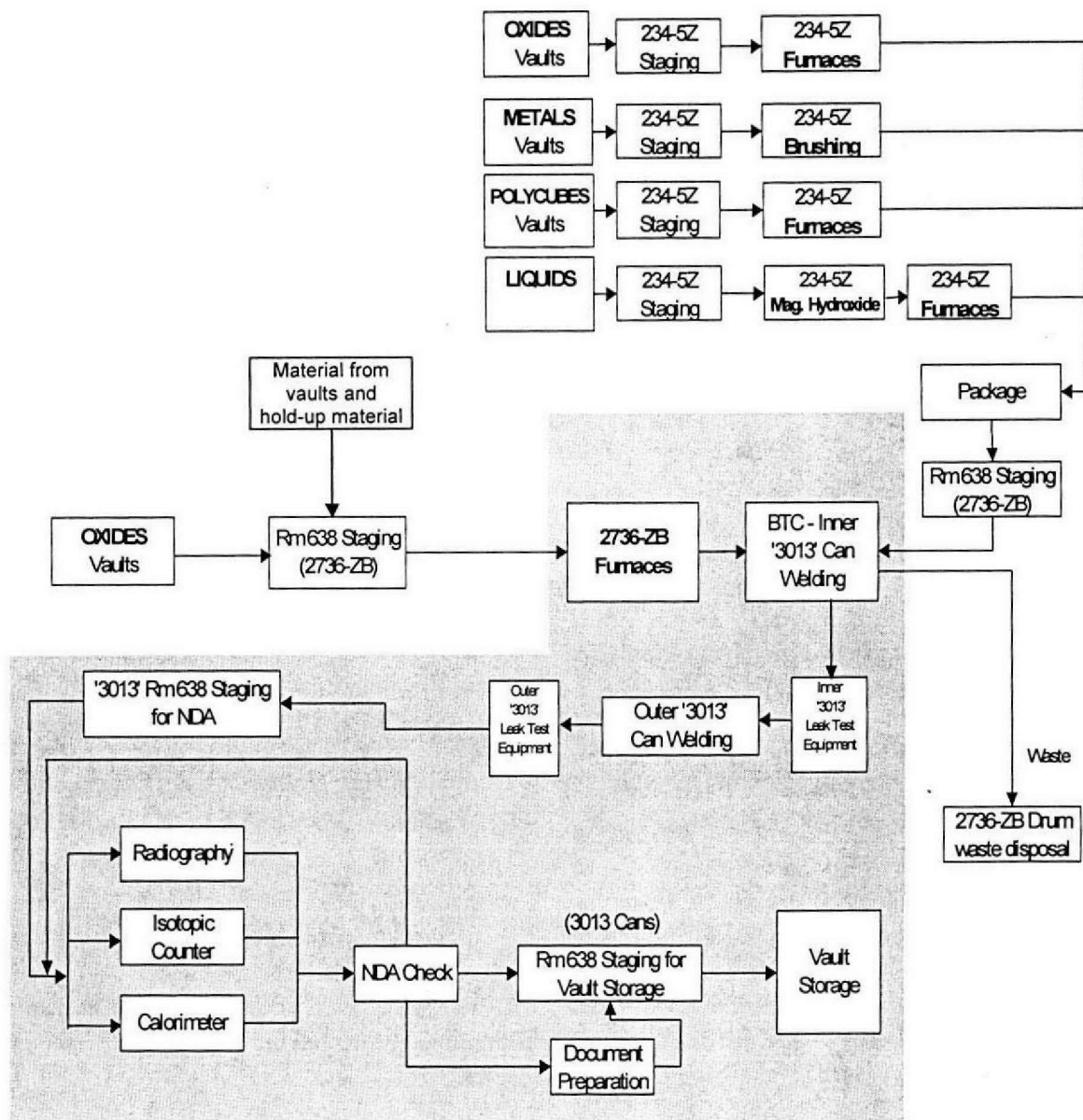
STANDARD	REQUIREMENT	STATUS
ANSI/ASME AG-1	Fans	Not applicable (built before standard implemented)
	Ductwork	Not applicable (built before standard implemented)
	HEPA filters	Applicable to replacement HEPA filters
	Dampers	Not applicable (built before standard implemented)
	Design requirements	Applicable to replacement HEPA filters
	Quality assurance	Not applicable (built before standard implemented)
ASME/ANSI N509	Quality assurance	Not applicable (built before standard implemented)
	Filter housing	Pre-filters, two stages of HEPA filters (in four parallel banks), and dampers are certified to meet purchase order specifications regarding fabrication, materials, welds, and final inspections
ASME/ANSI N510	Bypass leak testing	Ultrasonic testing at filter changes
	Visual inspection	Performed annually (with no significant findings identified); conforms to requirement
	Aerosol test	Performed annually; meets intent of N510 requirements as described in Section 10.0
ANSI/ASME NQA-1	Quality assurance requirements	Not applicable (built before standard implemented)
	Sampling and analysis procedures	Complies with HNF-0528-3; conforms to applicable NQA-1 requirements
40 CFR 60, Appendix A	Methods 1 and 2	Applicable (annual testing conforms to requirements)
	Methods 1A, 2A, 2C, 2D, 4, 5, and 17	Not applicable
ANSI 13.1 (1969)	Equal annular nozzle spacing	Conforms to requirements
	Near isokinetic sampling and other requirements	Sampling system provides periodic confirmatory measurements as described in Sections 9.0 and 13.0

Table 2. Status of Conformance to Technology Standards for Major Stack 296-Z-7.

STANDARD	REQUIREMENT	STATUS
ANSI/ASME AG-1	Fans	Procured to Section BA of ASME AG-1
	HEPA filters	Meets the requirements of FC-1000-FC9200
ASME/ANSI N509	HEPA filter housing	Meets the design and construction requirements
	Butterfly valves	Meets the design and construction requirements
	Piping	Meets the design and construction requirements
ASME/ANSI 510	Pressure decay test	Piping and housings were leak tested
	Visual inspection	HEPA filter housing is inspected visually annually
	Aerosol test	HEPA filter aerosol tested annually
ASME/ANSI NQA-1	Design requirements	HEPA filter and filter housings meet NQA-1 requirements
40 CFR 60, Appendix A	Methods 1 and 2	Modified per ANSI N13.1
	Methods 1A,2A,2C,2D,4,5, and 17	Not applicable
ANSI N13.1 (1999)	Representative sampling using shrouded probes	System was qualified by testing

## 14.0 REFERENCES

- AIR 92-107, letter, A.W. Conklin, Washington State Department of Health, to J.D. Bauer, U.S. Department of Energy, Richland Operations Office, no subject, October 5, 1992.
- ANSI/HPS N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities*, American National Standards Institute, Inc.
- ANSI N13.1-1969, *Guide to Sampling Airborne Radioactive Materials in a Nuclear Facility*, American National Standards Institute, Inc., New York, New York.
- ASME, 1997, *Code on Nuclear Air and Gas Treatment*, AG-1, Article FC-1121, American Society of Mechanical Engineers.
- DOE-STD-3013-2000 and/or latest revision, *Stabilization, Packaging, and Storage of Plutonium-Bearing Materials*.
- DOE/RL-99-41, *Radionuclides Air Emissions Report for the Hanford Site, Calendar Year 1998*, June 1999, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- DOE/RL-2003-19, *Radionuclide Air Emissions Report for the Hanford Site, Calendar Year 2002*, June 2001, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
- Fluor, 2003, Letter, FH-0300209, D. Van Leuven to M. Schlender, *Satisfaction of Two Notice of Construction Conditions for DOE/RL-2000-42, Revision 2, Radioactive Air Emissions Notice of Construction for Plutonium Finishing Plant Project W-460, Plutonium Stabilization and Handling*, dated February 11, 2003.
- HNF-0528, *NESHAP Quality Assurance Project Plan for Radioactive Airborne Emissions*, Fluor Hanford, Richland, Washington, updated periodically.
- HNF-3602, Revision 1, *Calculating Potential to Emit Releases and Doses for FEMPs and NOCs*, January 2002, Fluor Hanford, Richland, Washington.
- HNF 6385, *Fire Hazard Analysis for Plutonium Finishing Plant 2736-Z Complex*, January 2001, Dyncorp Tri-Cities Services, Inc., Richland, Washington.
- HNF-S-0552, *Specification for Procurement and Onsite Storage of Nuclear Grade High-Efficiency Particulate Air (HEPA) Filters*, Rev. 2, June 2000, Fluor Hanford, Richland, Washington.
- HNF-SD-CP-SAR-021, Rev 1, *Plutonium Finishing Plant Final Safety Analysis Report*, Fluor Hanford, Richland, Washington.
- HNF-SD-W460-CDR-001, Rev. 1, *Conceptual Design Report – Plutonium Stabilization and Handling, Project W-460*, Fluor Hanford, Richland, Washington.
- HNF-SD-W460-FDC-001, Rev. 1, *Functional Design Criteria - Plutonium Stabilization and Handling (PuSH) Project W-460*, Fluor Hanford, Richland, Washington.



**Note: BTC = Bagless Transfer Container.**  
**Shaded area denotes Stabilization and Packaging Equipment Operations.**

Figure 1. Process Flow Diagram.

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# 2736-ZB Building Ventilation Schematic and Identification of Safety Systems, Structures, and Components.

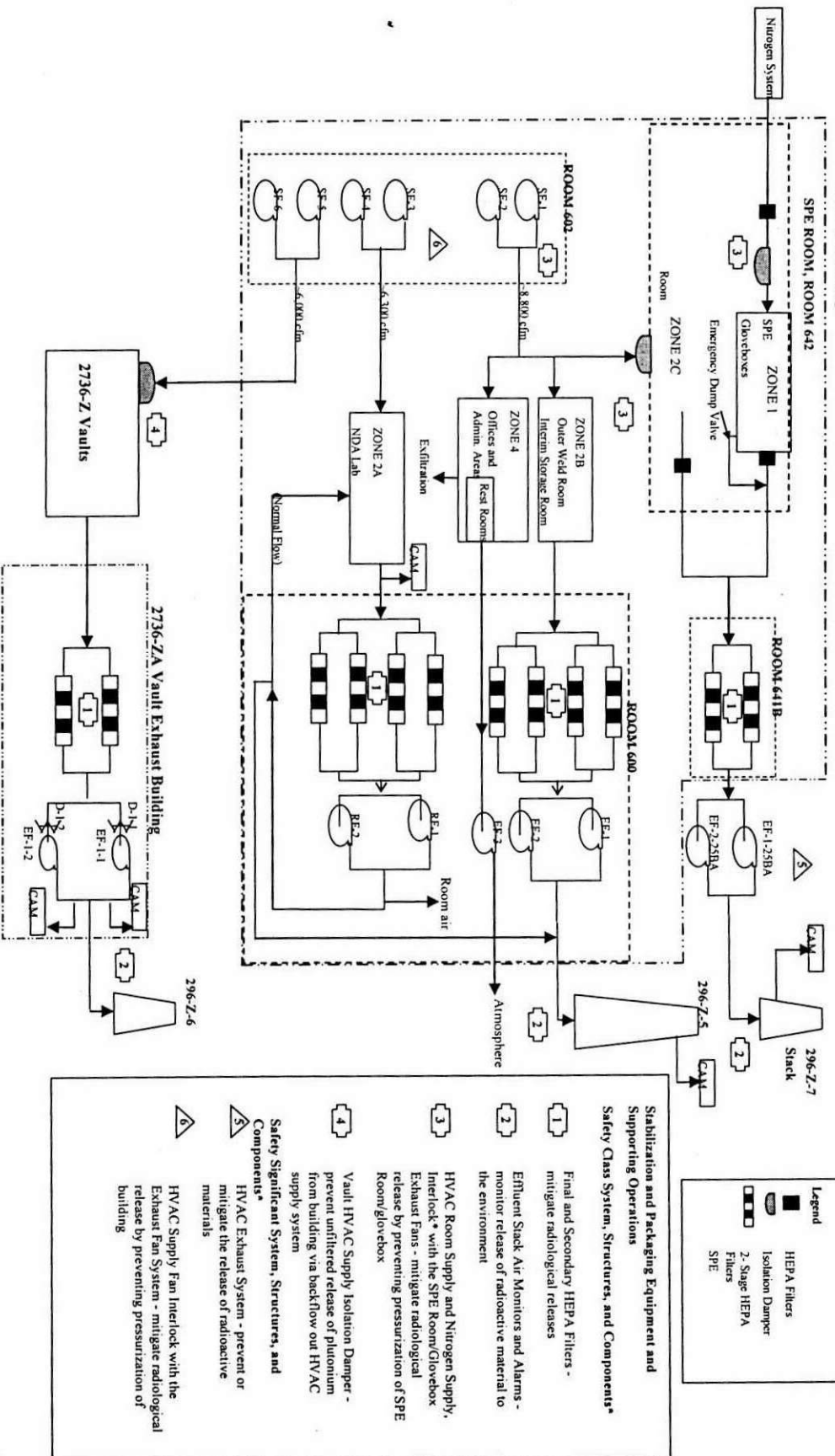


Figure 2. Ventilation Schematic for SPE.

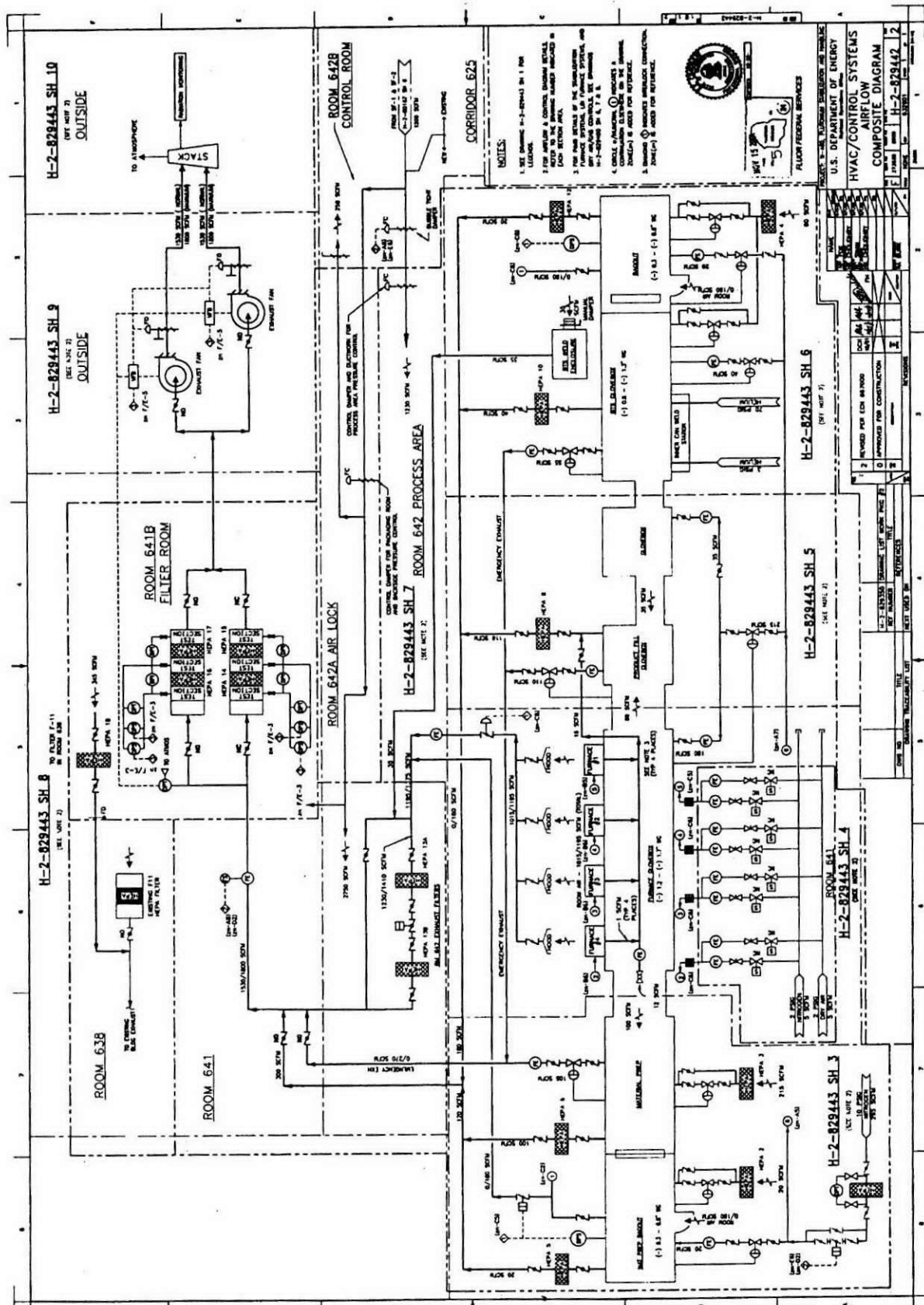


Figure 3. Schematic of the SPE Offgas System Exhausting through the 296-Z-7 Stack.

Table 3. SPE Releases (through the 296-Z-7 Stack).

Radionuclide	Annual inventory (grams)	Activity (curies per gram)	Annual inventory (curies)	Release factor	Unabated release (Ci)
Pu-239	$1.6 \times 10^6$	0.06	$9.6 \times 10^4$	$10^{-3}$	$9.6 \times 10^1$
U-233	$1.1 \times 10^6$	0.01	$1.1 \times 10^4$	$10^{-3}$	$1.1 \times 10^1$
Am-241	$5.0 \times 10^4$	3.4	$1.7 \times 10^5$	$10^{-3}$	$1.7 \times 10^2$
Np-237	$1.0 \times 10^2$	0.0007	$7.0 \times 10^{-2}$	$10^{-3}$	$7.0 \times 10^{-5}$

Table 4. Dose Estimates for the 296-Z-5 Stack.

Radionuclide	Inventory (curies)	Release factor	Unabated release (Ci)	Unit dose factor <sup>a</sup>	Unabated TEDE to the MEI (millirem per year)	Abated TEDE to the MEI <sup>b</sup> (millirem per year)
alpha (as Pu-239)	5	$10^{-3}$	$5 \times 10^{-3}$	11	$5.5 \times 10^{-2}$	$2.8 \times 10^{-5}$
beta (as Sr-90)	$1.2 \times 10^{-4}$	$10^{-3}$	$1.2 \times 10^{-7}$	$1.1 \times 10^{-2}$	$1.3 \times 10^{-9}$	$6.5 \times 10^{-13}$
Total					$5.5 \times 10^{-2}$	$2.8 \times 10^{-5}$

<sup>a</sup> HNF-3602, Revision 1, *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs*, Table 4-10, effective release height <40 meters, onsite MPR.

<sup>b</sup> Credit for one-stage of HEPA filtration (decontamination factor of  $5 \times 10^{-4}$ ).

Table 5. Dose Estimates for the 296-Z-6 Stack.

Radionuclide	Inventory (curies)	Release factor	Unabated release (Ci)	Unit dose factor <sup>a</sup>	Unabated TEDE to the MEI (millirem per year)	Abated TEDE to the MEI <sup>b</sup> (millirem per year)
alpha (as Pu-239)	5	$10^{-3}$	$5 \times 10^{-3}$	11	$5.5 \times 10^{-2}$	$2.8 \times 10^{-5}$
beta (as Sr-90)	$1.2 \times 10^{-4}$	$10^{-3}$	$1.2 \times 10^{-7}$	$1.1 \times 10^{-2}$	$1.3 \times 10^{-9}$	$6.5 \times 10^{-13}$
Total					$5.5 \times 10^{-2}$	$2.8 \times 10^{-5}$

<sup>a</sup> HNF-3602, Revision 1, *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs*, Table 4-10, effective release height <40 meters, onsite MPR.

<sup>b</sup> Credit for one-stage of HEPA filtration (decontamination factor of  $5 \times 10^{-4}$ ).

Table 6. SPE Release Rates and Dose Estimates for 296-Z-7 Stack.

Radionuclide	Annual Inventory <sup>a</sup> (grams)	Inventory (curies)	Release factor	Unabated release (Ci)	Unit dose factor <sup>b</sup>	Unabated TEDE to the MEI (millirem per year)	Abated TEDE to the MEI <sup>c</sup> (millirem per year)
Pu-239	$1.6 \times 10^6$	$9.6 \times 10^4$	$10^{-3}$	$9.6 \times 10^1$	11	$1.1 \times 10^3$	$3.0 \times 10^{-4}$
U-233	$1.1 \times 10^6$	$1.1 \times 10^4$	$10^{-3}$	$1.1 \times 10^1$	4.2	$4.6 \times 10^1$	$1.2 \times 10^{-5}$
Am-241	$5.0 \times 10^4$	$1.7 \times 10^5$	$10^{-3}$	$1.7 \times 10^2$	17	$2.9 \times 10^3$	$7.9 \times 10^{-4}$
Np-237	$1.0 \times 10^2$	$7.0 \times 10^{-2}$	$10^{-3}$	$7.0 \times 10^{-5}$	16	$1.1 \times 10^{-3}$	$3.0 \times 10^{-10}$
Total						$4.0 \times 10^3$	$1.1 \times 10^{-3}$

<sup>a</sup> See Section 7.0.

<sup>b</sup> HNF-3602, Revision 1, *Calculating Potential-to-Emit Releases and Doses for FEMPs and NOCs*. For conservatism, Table 4-10: Pu-239, effective release height <40 meters, onsite MPR.

<sup>c</sup> Credit for two-stages of HEPA filtration (decontamination factor of  $2.7 \times 10^{-7}$ ).

Table 7. Total SPE Release Rates and Dose Estimates.

Emission Unit	Unabated TEDE to the MEI (millirem per year)	Abated TEDE to the MEI (millirem per year)
296-Z-5 <sup>a</sup>	$5.5 \times 10^{-2}$	$2.8 \times 10^{-5}$
296-Z-6 <sup>b</sup>	$5.5 \times 10^{-2}$	$2.8 \times 10^{-5}$
296-Z-7 <sup>c</sup>	$4.0 \times 10^3$	$1.1 \times 10^{-3}$
Total	$4.0 \times 10^3$	$1.2 \times 10^{-3}$

<sup>a</sup> Refer to Table 4.

<sup>b</sup> Refer to Table 5.

<sup>c</sup> Refer to Table 6.

**ATTACHMENT A**

**DISCUSSION OF BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY**

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## **DISCUSSION OF BEST AVAILABLE RADIONUCLIDE CONTROL TECHNOLOGY (REQUIREMENT 16)**

Pursuant to WAC 246-247-110(16), providing cost factors for construction, operation, and maintenance of the proposed control technology components are not required because the following best available radionuclide control technology (BARCT) discussion is provided. The BARCT is defined by WAC 246-247-030 as follows:

"Technology that will result in a radionuclide emission limitation based on the maximum degree of reduction for radionuclides from any proposed newly constructed or significantly modified emission units that the licensing authority determines is achievable on a case-by-case basis. A BARCT compliance demonstration must consider energy, environmental, and economic impacts, and other costs through examination of production processes, and available methods, systems and techniques for control of radionuclide emissions. A BARCT compliance demonstration is the conclusion of an evaluative process that results in the selection of the most effective control technology from all know feasible alternatives. In no event shall application of BARCT result in emissions of radionuclides that could exceed the applicable standards of WAC 246-247-040. Control technology that meets BARCT requirements also meets ALARCT requirements."

As stated in WAC 246-247-120, only those radionuclides comprising more than 10 percent of the unabated dose need to be evaluated. All of the dose is due to particulate radionuclides. WDOH has provided guidance that HEPA filters generally are considered BARCT for particulate emissions (AIR 92-107).

It is proposed, pursuant to the quoted citation and the cited WDOH guidance, that the ventilation system described in Section 8.0 and the controls (engineering and administrative) described in Section 9.0 be approved as BARCT for the proposed activities.

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Enclosure 2

NOTICE OF OFF-PERMIT CHANGE FOR THE HANFORD SITE AIR OPERATING  
PERMIT (AOP) (NUMBER 00-05-006) FOR RADIOACTIVE AIR EMISSIONS NOTICE OF  
CONSTRUCTION (NOC), DOE/RL-2000-42, REVISION 3,  
PLUTONIUM FINISHING PLANT STABILIZATION AND PACKAGING EQUIPMENT

# HANFORD SITE AIR OPERATING PERMIT

## Notification of Off-Permit Change

Permit Number: 00-05-006

This notification is provided to Washington State Department of Ecology, Washington State Department of Health, and the U.S. Environmental Protection Agency as notice of an off-permit change described as follows.

This change is allowed pursuant to WAC 173-401-724(1) as:

1. Change is not specifically addressed or prohibited by the permit terms and conditions
2. Change does not weaken the enforceability of the existing permit conditions
3. Change is not a Title I modification or a change subject to the acid rain requirements under Title IV of the FCAA
4. Change meets all applicable requirements and does not violate an existing permit term or condition
5. Change has complied with applicable preconstruction review requirements established pursuant to RCW 70.94.152.

Provide the following information pursuant to WAC-173-401-724(3):

### Description of the change:

A Radioactive Air Emissions Notice of Construction, *Radioactive Air Emissions Notice of Construction for Plutonium Finishing Plant Stabilization and Packaging Equipment*, Revision 3, is being submitted to the Washington Department of Health (Health) for approval and the U.S. Environmental Protection Agency (EPA) for information. A change in the Hanford Site Air Operating Permit is required to indicate this source of air emissions.

### Date of Change:

Effective date will be the approval by DOH of the NOC.

### Describe the emissions resulting from the change:

Radioactive air emissions with the total estimated unabated and abated TEDE to the hypothetical MEI is 4.0E+03 and 1.2E-03 millirem per year, respectively.

### Describe the new applicable requirements that will apply as a result of the change:

Applicable requirements will be identified in approval notification by Health.

### For Hanford Use Only:

AOP Change Control Number:

Date Submitted: